The claims remaining in the application are 1-7, 13-24, 29-39, 45-56, and 61-64.

REMARKS

The Applicants would like to thank the Examiner for the quick and courteous Office Action. The Applicants amended paragraph [0051] on page 17 of the specification to correct an inadvertent error.

The Applicants greatly appreciate the Examiner's allowance of method claims 33-39, 45-51, 53-56 and 61-64. The Applicants are also grateful to the Examiner for the indications that claims 5 and 52 would be allowable if rewritten or amended to overcome the respective objection and rejection to be in independent form including all of the limitations of the base claim and any intervening claim.

Restriction Requirement

The Examiner acknowledged Applicants' election with traverse, but the Examiner did not find the Applicants' reasons for traverse persuasive.

The Applicants would respectfully direct the Examiner's attention to the fact that non-elected claims 8-12, 25-28, 40-44, 57-60 and 65-66 are hereby canceled without prejudice to Applicants' right to present such claims at a later date in a continuing application. It is thus respectfully submitted that the restriction requirement is avoided herein. Reconsideration is respectfully requested.

Obviousness-Type Double Patenting Rejection

The Examiner rejected claims 13-24 and 29-32 under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over claims 1-22 of U.S. Pat. No. 6,126,872. The Examiner notes that although the conflicting claims are not identical, they are not patentably distinct from each other because the core of said patent is also polymerized in the presence of a catalyst and since an invention in a product-by-process claim is a product, not a process.

The Applicants would respectfully traverse. The Examiner's attention is respectfully directed to the enclosed terminal disclaimer signed by an attorney of record. It is respectfully submitted that this timely filed terminal disclaimer overcomes the subject non-statutory double patenting ground as the Examiner noted with respect to 37 CFR §§1.321(c) and 1.130(b). The Applicants thus respectfully submitted that the subject rejection is overcome.

35 U.S.C. §112, Second Paragraph, Rejection

The Examiner has rejected claims 20 and 52 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The recited "derivatives" in claims 20 and 52 is allegedly indefinite in not specifying particular functional groups or substituents.

The Applicants would respectfully traverse.

The Examiner's attention is respectfully directed to the amendments to claims 20 and 52 herein where the term "derivatives" has been deleted and replaced by the word glycols in each claim. It is respectfully submitted that this change is supported by the specification as filed at page 17, lines 5-7 (paragraph [0051]) which has been amended herein in a parallel way. The Applicants stipulate that no derivatives are defined. However, Applicants had a *bona fide* intent to encompass alkoxypolyethylene *glycols* as one particular derivative since polyethylene *glycols* are recited immediately previous thereto in all locations where "derivatives" is used. This specification sentence now recites: "In one non-limiting embodiment of the invention, the skin is formed over the outer surface of the shell in combination with polyethylene glycols or alkoxypolyethylene ~~derivatives~~ glycols." It is respectfully submitted that these changes are to correct a mere inadvertent error and are not for any reason substantially related to patentability. It may be understood that the scope of claims 20 and 52 has been narrowed to alkoxypolyethylene glycols by these amendments.

It is respectfully submitted that the subject 35 U.S.C. §112, second paragraph, has been overcome. Reconsideration is respectfully requested.

35 U.S.C. §102/§103 Rejection over WO 98/16586

The Examiner has rejected claims 1-4, 6 and 7 under 35 U.S.C. §102(b) as allegedly anticipated by, or in the alternative, under 35 U.S.C. §103(a) as allegedly obvious over WO 98/16586.

The Examiner contends that WO 98/16586 teaches nonaqueous drag reducing suspension obtained by grinding a high molecular weight hydrocarbon-soluble polymer in the presence of waxes in examples. The Examiner alleges that wax coated hydrocarbon-soluble polymer inherently meets the instant particulate since the grinding destroys the instant core-shell structure. Thus, the Examiner contends that the invention lacks novelty.

The Applicants must respectfully traverse.

The Applicants would note that WO 98/16586 corresponds to U.S. Pat. No. 6,172,151. The Applicants additionally note that the Examiner only discusses novelty and that no reason is given for why the rejected claims are allegedly obvious from WO 98/16586.

A patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047, 34 U.S.P.Q.2d 1565 (Fed. Cir.), cert. denied, 116 S.Ct. 516 (1995). As will be further explained, it is respectfully submitted that the reference does not disclose each and every limitation of the claims as amended herein.

To support an obviousness rejection, the Examiner has the initial burden of establishing a *prima facie* case of obviousness of the pending claims over the cited prior art, *In re Oeticker*, 977 F.2d 1443, 1445; 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). As will be further explained, it is respectfully submitted that the Examiner has not established a *prima facie* case of obviousness of the pending claims as amended herein.

The Examiner's attention is respectfully directed to the amendment to claim 1 herein, where the claim now recites at the end thereof "where the shell acts as an anti-

agglomeration agent". It is respectfully submitted that support for this language is found in the specification as originally filed at page 9, lines 6-8, paragraph **[0032]** which recites "From a grinding point of view, the macrocapsules are unique in the sense that *the shell material encapsulating the polymer acts as an anti-agglomeration agent.*" (Emphasis added.) Because of this support, it is respectfully submitted that the amendment to claim 1 does not constitute an improper insertion of new matter.

As the Examiner notes, WO 98/16586 simply grinds a high molecular weight hydrocarbon-soluble polymer *in the presence of* waxes. This gives a different structure and result from that claimed herein. When the shells encapsulating the cores of the instant claims are ground, some portions of the shell fragments naturally and continue to adhere to the core fragments. This residual physical adhesion enhances the anti-agglomeration effect of the shell because at that interface, that side of the core fragment is physically protected from adhesion and agglomeration.

Further, there is much more intimate interaction between the shell material and the polymer core in the claimed invention because they are reactively linked as contrasted with a simple physical interaction in the case of the grinding of WO 98/16586 where the components are initially separate and brought together during the grinding. By "reactively linked" is not necessarily meant a covalent bond between the atoms of the shell and those of the core, but rather any adhesive force between the shell fragments and the core fragments that would tend to keep them together, including, but not necessarily limited to, static forces, hydrogen bonding, and the like. In short, the claim 1 composition is a different structure from that taught in WO 98/16586.

Because WO 98/16586 does not teach or suggest ground shell and core structures nor the fact that when such shell and core structures are ground the shell fragments or pieces act as particularly effective anti-agglomeration agents as claimed, the reference does not teach each and every limitation of the amended claims. Further, because WO 98/16586 does not suggest or hint at the shell and core structures as claimed, the reference does not render obvious the claimed invention. Reconsideration is respectfully requested.

35 U.S.C. §102/§103 Rejection over Kommareddi, et al.

The Examiner has rejected claims 13-24 and 29-32 under 35 U.S.C. §102(e) as allegedly anticipated by, or in the alternative, under 35 U.S.C. §103(a) as allegedly obvious over U.S. Pat. No. 6,126,872 to Kommareddi, et al.

The Examiner contends that Kommareddi, et al. teach the instant core-shell polymer in examples and claims. Thus, the instant invention allegedly lacks novelty.

The Applicants must again respectfully traverse.

Additionally, the Applicants note that the Examiner only discusses novelty and that no reason is given for why the rejected claims are allegedly obvious from Kommareddi, et al. A patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd., id.*

With respect to claims 13-16, these claims (via claim 13) require that the core reaction material comprises a monomer and a pre-polymerized catalyst. Kommareddi, et al. does not teach or suggest that the core reaction material comprises a pre-polymerized catalyst. Because the single Kommareddi, et al. reference does not teach each and every limitation of the claim, the instant claims are novel over the reference. Furthermore, it is respectfully submitted that Kommareddi, et al. does not teach or suggest or hint anything about using a pre-polymerized catalyst. The use of a pre-polymerized catalyst can be a critical step to get a better reaction, depending on the polymerization reaction chemistry. Thus, it is respectfully submitted that the claims are not obvious from the reference.

With respect to claims 17-20, these claims recite that the shell contains polyethylene oxide and that the polyethylene oxide forms a skin over the outer surface of the shell. Kommareddi, et al. does not teach or suggest the structure of polyethylene oxide having a skin over the outer surface of the shell. Because the single Kommareddi, et al. reference does not teach each and every limitation of the claim, the instant claims are novel over the reference. Furthermore, it is respectfully submitted that Kommareddi, et al. does not suggest or hint anything about polyethylene oxide bearing or having a skin over the outer surface of the shell. Thus, it is respectfully submitted that the claims are not obvious from the reference.

With respect to claims 21-24, these claims, via independent claim 21, recite that the materials forming the shell have at least a portion of water therein removed, and that the water removal could be accomplished by vacuum stripping and/or molecular sieves. Kommareddi, et al. does not teach or suggest shell materials having reduced water content or removing water from the materials forming the shell. The resulting structures of the instant claims would be physically different from the encapsulated compounds formed by Kommareddi, et al. because the Kommareddi, et al. structures would have more water and the encapsulated compounds of the claimed invention would have less water. The resulting structures are thus compositionally different from those of Kommareddi, et al. Because the single Kommareddi, et al. reference does not teach each and every limitation of the claim, the instant claims are novel over the reference. Furthermore, it is respectfully submitted that Kommareddi, et al. does not suggest or hint about anything concerning removing water from the shell materials. Thus, it is respectfully submitted that these claims are also not obvious from the reference.

With respect to claims 29-32, these claims (by way of independent claim 29) recite that the polymerization of the monomers in the core are not catalyzed by the main catalyst until a co-catalyst is added thereto. Kommareddi, et al. does not teach or suggest the use of such a co-catalyst. The structures or compositions encompassed by these claims are structurally different from those taught or suggested by Kommareddi, et al. because the latter are only required to have one catalyst, whereas the instant, claimed encapsulated compounds are required to have *two* catalysts -- one of which is a main catalyst and the other of which is a different, co-catalyst. Because the single Kommareddi, et al. reference does not teach each and every limitation of claim 29, the instant claims are novel over the reference. Furthermore, it is respectfully submitted that Kommareddi, et al. does not suggest or hint about anything concerning using a co-catalyst in the core. Thus, it is respectfully submitted that these claims are further not obvious from the reference.

Thus, because the single Kommareddi, et al. does not each every limitation of the rejected claims, the rejected claims are novel thereover, contrary to the Examiner's supposition. Further, since Kommareddi, et al. does not suggest or propose or hint at the various elements discussed for each group of claims, it is respectfully submitted that the Examiner

has not made a *prima facie* obviousness rejection of those claims over Kommareddi, et al. Reconsideration is respectfully requested.

35 U.S.C. §102/§103 Rejection over Martin, et al.

The Examiner has rejected claims 13, 15, 21, 22, 24, 29 and 31 under 35 U.S.C. §102(e) as allegedly anticipated by, or in the alternative, under 35 U.S.C. §103(a) as allegedly obvious over U.S. patent application 2003/0113445 to Martin, et al.

The Examiner contends that Martin, et al. teaches the instant core-shell polymer in Example 1 since the instant claim are allegedly silent as to a particular polymerization method. Eudragit E100 is taught as a methacrylate copolymer in [0015]. An invention in a product-by-process claim is a product, not a process. Thus, the instant invention lacks novelty.

Again, the Applicants must respectfully traverse. A patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd., id.*

The Applicants additionally note that the Examiner only discusses novelty and that no reason is given for why the rejected claims are allegedly obvious from Martin, et al. To support an obviousness rejection, the Examiner has the initial burden of establishing a *prima facie* case of obviousness of the pending claims over the cited prior art, *In re Oeticker, id.*

Claim 13 herein and claims dependent thereon require a core reaction material comprising a monomer and a pre-polymerized catalyst. Claim 21 and claims dependent thereon and claim 29 and claims dependent thereon require:

> a core comprising the compound selected from the group consisting of:
> polymers formed within the shell;
> monomers which are polymerized within the shell, where the shell is inert to monomer polymerization.

It is respectfully submitted that Martin, et al. does not teach any of these types of cores. All that Martin, et al. is doing is making a core blend and later putting a shell around it

through a precipitation or other process. There is no polymerization reaction occurring within the Martin, et al. cores. The Examiner attempts to explain away this important distinction by stating that "An invention in a product-by-process claim is a product, not a process." However, an important characteristic of the claimed invention is the fact that because the polymerization occurs as bulk polymerization in the core very high molecular weights can be achieved in this manner. The Examiner's attention is respectfully directed to paragraph **[0036]** of the application as filed and elsewhere:

> **[0036]** A particular advantage of the microencapsulation technique of this invention is that the polymerization may be conducted entirely within the microcapsule (or macrocapsule) *small scale bulk polymerization conditions in the absence of a solvent, or in the presence of only a very small amount of solvent.* Conventionally, production of the very high molecular weight polymers useful as DRAs necessarily is done at high dilutions in a suitable solvent. Removal of large amounts of solvent thus becomes an issue, since transportation of large amounts of ineffective solvent to the site of drag reduction is an unnecessary expense. However, in the microencapsulation process, very little or no solvent is required, and *the polymerization reaction may be conducted within the microcapsule (or macrocapsule) by conventional techniques. Very high molecular weight DRAs may be produced, for example on the order of 10 million weight average molecular weight or more.* (Emphasis added.)

Because the monomers can be bulk polymerized within the capsule, very high molecular weights may be achieved, in contrast to the Martin, et al. process.

The Applicants have reviewed Martin, et al.'s paragraph [0015] noted by the Examiner, and saw where Eudragit is taught as a methacrylate copolymer, and where Eudragit E100 is taught as the shell resin in Example 1 of Martin, et al. However, in Martin, et al.'s case, the already polymerized core resin polyvinyl pyrrolidone is dispersed in hexane, and the shell is applied slowly through a precipitation process. The polyvinyl pyrrolidone is not formed *in situ* in the shell via bulk polymerization to very high molecular weight.

Furthermore, in the context of the bulk polymerization of this invention and the resultant very high molecular weight materials, it is not seen where Martin, et al. teaches the use of a pre-polymerized catalyst (claims 15 and 15), where the shell has at least a

portion of the water removed (claims 21, 22 and 24), or where the main catalyst cannot catalyze the polymerization until a co-catalyst is added thereto (claims 29 and 31).

For all of these reasons, it is respectfully submitted that the instant rejection must fail. The single reference does not suggest or hint at each and every limitation of the claim, as noted. Furthermore, Martin, et al. does not teach or suggest employing those necessary elements recited in the rejected claims – there is no motivation noted by the Examiner for modifying Martin, et al. to result in the recited structures of the claims. The Examiner has not noted any such motivation. Reconsideration is respectfully requested.

35 U.S.C. §102/§103 Rejection over O'Mara, et al.

The Examiner has rejected claims 1-4 and 6 under 35 U.S.C. §102(b) as allegedly anticipated by, or in the alternative, under 35 U.S.C. §103(a) as allegedly obvious over U.S. Pat. No. 4,826,728 to O'Mara, et al.

The Examiner contends that O'Mara, et al. teach drag reducing suspensions obtained by grinding a high molecular weight hydrocarbon-soluble polymer such as poly-isobutylene in the presence of TCP in examples. The Examiner asserts that the TCP coated hydrocarbon-soluble polymer inherently meets the instant particulate since the grinding destroys the instant core-shell structure. The Examiner thus concludes that the instant invention lacks novelty.

Yet again, the Applicants must respectfully traverse. A patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd., id.* To support an obviousness rejection, the Examiner has the initial burden of establishing a *prima facie* case of obviousness of the pending claims over the cited prior art, *In re Oeticker, id.* Once more, the Examiner only argues lack of novelty, with no argument or position put forth with respect to obviousness.

The Applicants respectfully submit that the subject claims are novel and non-obvious over O'Mara, et al. for the same reason that they are novel and non-obvious over WO 98/16586, previously addressed. The Examiner is reminded that the claimed shell is now

recited to act as an anti-agglomeration agent upon grinding of the core and shell structure. The shell is of particular effectiveness because the ground shell fragments adhere to some extent to the core fragments providing a physical barrier to agglomeration. Further as explained *supra*, there is much more intimate interaction, *i.e.* reactive linking as noted *supra*, between the shell material and the polymer material, whereas in O'Mara, et al. a finely divided, solid coating agent is simply mingled with the comminuted polymer.

Furthermore, the recited core and shell structure required by claim 1 is not taught by nor suggested by O'Mara, et al. The O'Mara, et al. protective shell is formed by the finely divided, solid coating agent through mixing, not encapsulation as recited, thus this limitation of the claims is not taught by the O'Mara, et al. reference. Further, O'Mara, et al. does not teach or suggest a core comprising a compound that includes a polymer formed within the shell or a core comprising monomers which are polymerized within the shell. O'Mara, et al.'s "core" is pre-formed polymer that has been comminuted. It has not been bulk polymerized within the shell to very high molecular weights as required by the claims. Nor does O'Mara, et al. suggest or propose any of these required features.

Thus, it is respectfully submitted that the amended claims are not obvious from O'Mara, et al. since a *prima facie* case for obviousness has not been made, and they are further novel over O'Mara, et al. because this single reference does not teach each and every limitation of the amended claims. Reconsideration is respectfully requested.

It is further respectfully submitted that claim 5 is patentable for the same reasons that claim 1, from which it depends. Additionally, it is respectfully submitted that claim 52 is patentable for the same reasons that claim 49, from which it depends, and for the reason that the 35 U.S.C. §112, second paragraph, rejection has been avoided by amendment to claim 52 as previous established.

It is respectfully submitted that the amendments and arguments presented above overcome all objections and rejections of the claims. Reconsideration and allowance of the claims are respectfully requested. The Examiner is respectfully reminded of the duty to indicate allowable subject matter. The Examiner is invited to call the Applicants' attorney

at the number below for any reason, especially any reason that may help advance the prosecution.

Respectfully submitted,
NAGESH S. KOMMAREDDI, et al.,

David L. Mossman
Registration No. 29,570
Attorney for Applicants
Telephone No. 512/219-4026
Facsimile No. 512/219-4036

Madan, Mossman & Sriram, P.C.
2603 Augusta, Suite 700
Houston, TX 77057-5638